



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,005	05/26/2006	Horst Vestweber	14113-00013-US	8833
23416 7590 09/10/2010 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899				
EXAMINER				
CLARK, GREGORY D				
ART UNIT		PAPER NUMBER		
1786				
MAIL DATE		DELIVERY MODE		
09/10/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/581,005

Applicant(s)

VESTWEBER ET AL.

Examiner

GREGORY CLARK

Art Unit

1786

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-22 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) 2, 23 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-22 and 25-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/22/2010 has been entered. Claims 1, 3-22, and 25-28 pending.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 1. Claims 1, 3, 5, 7-18 and 25-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Tominaga (US 2003/0168970).**
- 2. Regarding Claims 1 and 3,** Tominaga discloses an organic electroluminescent device containing an anode, cathode (abstract) and a matrix material (4, 4'-bis (carbazol-9-yl) biphenyl (CBP)) (paragraph 117) doped with a phosphorescent emitter (paragraph 47). The device also has an electron transporting layer containing a phosphorus oxide derivative (paragraph 22). Tominaga also discloses that the electron transporting layer functions as a hole blocking layer which can efficiently inhibit the transport of holes (paragraph 17). Tominaga discloses a specific a phosphorus oxide derivative represented by Formula T-1 (page 15):



Formula T-1 meets the criteria of applicants' Formula 3 where Y=P, X=O and R1-R3 are aryl groups (per claims 1 and 3).

3. **Regarding Claim 5 and 25-26**, Tominaga discloses an organic electroluminescent device with an electron transporting layer that can contain Formula T-1 (as discussed above) (paragraph 15). Tominaga also discloses that the electron transporting layer functions as a hole blocking layer which can efficiently inhibit the transport of holes (paragraph 17) (per claim 26).

The examiner interprets this to mean that the hole blocking layer is only composed of Formula T-1 (per claim 5).

Formula T-1 (above) (hole blocking material) shows Y=P, X=O (has non-bonding electron pair) (per claim 25).

4. **Regarding Claims 7-9**, Tominaga discloses Formula T-1 (hole blocking material as discussed above) which contains a sp³ hybridized carbon atom (per claim 7) that is a quaternary carbon (per claims 8 and 9).

5. **Regarding Claims 10 and 11**, Tominaga discloses Formula T-1 (above) used in the OLED as discussed above. Formula T-1 is a 9, 9-disubstituted fluorene derivative.

6. **Regarding Claim 12**, Tominaga discloses an organic electroluminescent device (paragraph 1) that includes matrix materials that includes carbazoles or organometallic complexes (paragraph 47).

7. **Regarding Claim 13**, Tominaga discloses that the device can include the following layers: anode/hole transporting layer/emissive layer/electron transporting layer/cathode. Tominaga also discloses that the electron transporting layer functions as a hole blocking layer which can efficiently inhibit the transport of holes (paragraph 17). The above structure shows the electron transporting layer (hole blocking layer) next to the cathode.

8. **Regarding Claims 14 and 15**, Tominaga discloses and organic electroluminescent device that contain phosphorescence emitters such as tris (2-phenylpyridyl) iridium (atomic number 77) (paragraph 47). The examiner notes that in the applicants' specification on page 10 that iridium is listed as a preferred metal.

9. **Regarding Claim 16**, Tominaga discloses an organic electroluminescent device that contains phosphorescence emitters such as tris (2-phenylpyridyl) iridium (paragraph 47).

10. **Regarding Claim 17**, Tominaga discloses that the electron transporting layer functions as a hole blocking layer which can efficiently inhibit the transport of holes (paragraph 17) and has a glass transition temperature of at least 120 deg C (paragraph 19). The applicant claims a glass transition temperature of greater than 100 deg C.

11. **Regarding Claim 18**, Tominaga discloses that the organic layers are made from sublimable compounds (paragraph 118).

12. **Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Tominaga (US 2003/0168970) as evidenced by Burgi (J. Am. Chem. Soc. Vol. 16, 1983, pages 153- 161)**

13. **Regarding Claim 6**, Tominaga discloses Formula T-1 (hole blocking material as discussed above). Formula T-1 is a triphenyl phosphorus oxide based material which is a non-planar compound.

This position is supported by Burgi who teaches that triphenyl phosphorus oxide type materials have a trigonal-bipyramidal geometry (page 157).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 4, 19-22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tominaga (US 2003/0168970).

15. Regarding Claim 4, Tominaga discloses an organic electroluminescent device containing an electron transporting layer made of Formula T-1 (hole blocking layer as discussed above). Tominaga fails to mention the percentage of Formula T-1 in the hole blocking layer. The applicant claims a concentration of at least 50%.

Hole blocking materials are used in hole blocking layers to confine the holes to the emissive region of the device to improve the emission efficiency. The amount of a hole blocking material present is viewed as a cause effective variable that controls the confinement of hole that affect the emission efficiency.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to have adjusted the amount of the hole blocking material present in hole blocking layer to optimize the blocking of holes which would have included the claimed range, absent unexpected results.

16. Regarding Claims 19-22, Tominaga discloses that the organic layers can be formed by evaporation by resistance heating, electron beam evaporation, sputtering,

molecular deposition, coating and the like. Tominaga fails to mention the exact coating methods claimed by the applicant.

Tominaga teaches the device claimed by the applicant with respect to the chemical limitations. The limitations with respect to the coating method is viewed as a process limitation.

If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." (In re Thorpe, 227 USPQ 964,966). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to the applicant to come forward with evident establishing an unobvious difference between the claimed product and the prior art product (in re Marosi, 710 F.2nd, 802, 218 USPQ 289, 292 (Fed. Cir. 1983, MPEP 2113).

17. **Regarding Claims 27-28**, Tominaga discloses an organic electroluminescent device that is a thin film organic multi-layered device (paragraph 4).

An organic electroluminescent device is viewed as inclusive of the electronic devices mentioned in claims 27-28.

Response to Arguments

The applicants arguments are moot, in view of the new rejections based on a new interpretation of the prior art.

The previous rejection was based on Tominaga teaching an electron transporting layer containing BCP (2, 9-dimethyl-4, 7-diphenyl-1, 10-phenanthroline=bathocuproin).

Tominaga also teaches a device with electron transporting layer can contain a phosphorus oxide derivative which reads on applicants' claimed compound.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1786

GREGORY CLARK/GDC/
Examiner
Art Unit 1786